

J/ ψ elliptic flow and high p_T suppression measurements in A+A collisions by the PHENIX experiment

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J/ ψ suppression measurements have been widely used as a tool to explore the hot and dense deconfined matter that is formed in high-energy heavy ion collisions. In recent years, data from PHENIX has shed new light on the understanding of the centrality and kinematical dependence of J/ ψ suppression in A+A collisions. J/ ψ s at high p_T are of particular interest. The formation time of the J/ ψ , hence the duration in which the formed J/ ψ and the prehadronic $c\bar{c}$ states evolve in the hot medium depend on momentum. The measurement of the p_T dependence of the suppression can therefore provide a constraint on the relative strength of the interaction of J/ ψ with the medium in the hadronic and prehadronic states. An extension of the suppression measurement beyond the previous limit of $p_T=5$ GeV/c in Cu+Cu and possibly Au+Au collisions will be shown.

Suppression of J/ ψ in A+A collisions was also investigated as a function of rapidity. In Au+Au interactions, the rapidity dependence of the suppression is opposite to what is expected from local energy density dependent suppression models. This has led to the speculation that regeneration of J/ ψ from uncorrelated c and \bar{c} quarks could play a strong role. J/ ψ elliptic flow is a potential test of regeneration, since regenerated J/ ψ are expected to inherit the observed strong elliptic flow of heavy quarks. The latest results of the p_T dependence of J/ ψ elliptic flow from the 2007 Au+Au running period will be presented. Progress towards measuring higher mass quarkonia (ψ' , Υ) in Au+Au collisions will also be reviewed.